

December 12, 1889.

Sir G. GABRIEL STOKES, Bart., President, in the Chair.

The Presents received were laid on the table, and thanks ordered for them.

The following Papers were read:—

I. "The Relation of Physiological Action to Atomic Weight." By Miss H. J. JOHNSTONE, University College, Dundee, and THOS. CARNELLEY, Professor of Chemistry in the University of Aberdeen. Communicated by Sir HENRY ROSCOE, F.R.S. Received October 5, 1889.

II. "An Experimental Investigation into the Arrangement of the Excitable Fibres of the Internal Capsule of the Bonnet Monkey (*Macacus sinicus*).” By CHARLES E. BEEVOR, M.D., F.R.C.P., and VICTOR HORSLEY, B.S., F.R.S. (From the Laboratory of the Brown Institution). Received December 4, 1889.

(Abstract.)

After a historical introduction the authors proceed to describe the method of investigation, which was conducted as follows. The animal being narcotised with ether, the internal capsule was exposed by a horizontal section through the hemisphere. By means of compasses the outlines of the basal ganglia and capsule were accurately transferred to paper ruled with squares of 1 millimetre side, so that a projection of the capsule was thus obtained, divided into bundles of 1 millimetre square area. Each of these squares of fibres was then excited by a minimal stimulus, the same being an induced or secondary interrupted current. The movements were recorded and the capsule photographed.

In all 45 experiments were performed, and they are arranged in eight groups, representing eight successive levels (*i.e.*, from the centrum ovale to the crus) at which the capsule was investigated.

Before the results are described in detail a full account is given of previous investigations, experimental, clinical, and anatomical, on the arrangement of the internal capsule.

The anatomy of the part and the relation of the fibres to the basal ganglia are then discussed, and a full description given of each of the groups examined.

The general results are next given at length, of which the following is a *résumé*.

Firstly, the rare occurrence of bilateral movement is discussed, and the meaning of the phenomenon defined. Secondly, the lateral arrangement and juxtaposition of the fibres are considered. Thirdly, the antero-posterior order in which the fibres for the movements of the different segments are placed is described, and that order found to be practically identical with that observed on the cortex, viz., from before back.

Movements of eyes.

„	head.
„	tongue.
„	mouth.
„	upper limb (shoulder preceding thumb).
„	trunk.
„	lower limb (hip preceding toes).

The character or nature of these movements is set out in a table giving the average localisation of each segment. Speaking generally, it may be said that the movements are arranged in the same way as has already been shown by the authors to exist in the cortex (*vide* previous papers in ‘Phil. Trans.,’ 1887, 1888), viz., that the representation of extension is situated in front of that of flexion for the segments of the upper limb, while for the toes flexion is obtained, as in the cortex, in front of extension.

Numerous tables and diagrams are appended, showing the extent of appropriation of fibres for each movement.

III. “On the Effect of the Spectrum on the Haloid Salts of Silver.” By Captain W. DE W. ABNEY, C.B., R.E., D.C.L., F.R.S., and G. S. EDWARDS, C.E. Received November 26, 1889.

[Publication deferred.]